***Coordinate Perimeter and Area***

# **Common Core Standard**

G.GPE.7 Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

*Common Core Traditional Pathway: Geometry, Unit 4*

# **The Task**

This task will use a student’s knowledge of the distance formula, Pythagorean Theorem, and perimeter and area formulas to find the perimeter and area of polygons on a coordinate grid. Students will use given coordinates to determine necessary measurements for computing the perimeter and area of polygons. The students will work through a series of three problems that gradually increase in difficulty.

# **Facilitator Notes**

1. Students will be given a set of tasks (see attached assignment) to work through. It may be best to work in pairs or small groups, so that students can encourage and assist each other.
2. Students will need graph paper (1 cm), a straightedge, and a calculator for this task.
3. The problems may be done various ways. It may be necessary for you to determine which methods you would like your students to use. Also, it is important to think about how you will assess the students’ work, especially Task 3, due to the extension questions involved. Some facilitators may want to only score the perimeter and area parts of the answer.
4. As students work in their groups, be sure to address the questions provided in the task. These questions include, “Are we able to count the perimeter and area?” “Is there a formula to help find the perimeter and area?” “How do these methods compare?”
5. The task may take the entire class period as students work in groups and have multiple problems to complete. The last problem is an application of the basic math skills.
6. Use the follow-up questions as a guide for a closing discussion. Students should be able to conclude that it is not possible to count the perimeter and area of most figures, but only estimate them. It is essential to use formulas developed for finding such values.

# **Follow-Up Questions**

1. What observations can we make about counting the perimeter and area of figures?
2. What steps did we find essential in order to find all the necessary values needed for the perimeter and area formulas?
3. What conclusions can we make about our solutions found by counting the solutions versus using the formulas to find them?

# **Solutions**

See attached key.

**Follow Up Questions:**

1. What significance do we find in the formulas for perimeter and area today?
2. How might a person or business use the math we used today? Can you think of any specific applications of this math other than constructing a playground?